

WHAT IS CLAIMED IS:

1. A transfer method of transporting an object to be transferred to/from a stage, comprising:

supporting one surface of said object on a plurality
5 of support members;

loading said object supported by said plurality of support member onto said stage; and

withdrawing said plurality of support members from said object to an other surface side of said object after
10 loading said object onto said stage.

2. The method according to claim 1, wherein said supporting comprises:

moving relatively said object and said plurality of
15 support members such that contact portions of said plurality of support members are located on said one surface side of said object, the contact portions coming into contact with said object; and

moving said plurality of support members in
20 respective predetermined directions within a moving plane perpendicular to a direction in which said object and said support member relatively are moved.

3. The method according to claim 2, wherein said
25 supporting further comprises:

supporting said object on the contact portions of said support members by relatively moving said object and

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said plurality of support members, after respectively moving said plurality of support members in the respective predetermined directions.

5 4. The method according to claim 2, wherein the movements of said plurality of support members in the respective predetermined directions are rotational movements around a predetermined axis perpendicular to said moving plane.

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5. The method according to claim 2, wherein movements of said plurality of support members in the respective predetermined directions are simultaneously performed.

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6. The method according to claim 2, wherein movements of said plurality of support members in the respective predetermined directions are sequentially performed.

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7. The method according to claim 2, wherein movements of said plurality of support members in the respective predetermined directions are linear movements.

25 8. The method according to claim 7, wherein the linear movements of said plurality of support members are linear movements in directions approaching/withdrawing

from said object.

9. The method according to claim 7, wherein the linear movements of said plurality of support members are linear movements in directions parallel to radial directions to approach the center of said object.

10. The method according to claim 1, wherein said loading comprises:

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10 relatively moving said plurality of support members and said stage so as to contact said one surface of said object with said stage; and

moving said plurality of support members thereafter in predetermined directions within a plane perpendicular to a direction in which said support members and said stage relatively are moved.

11. The method according to claim 1, further comprising:

20 moving relatively said stage and said plurality of support members such that contact portions of said support members are located on said one surface side of said object supported on said stage, the contact portion coming into contact with said object;

25 moving said plurality of support members in respective predetermined directions within a plane perpendicular to a direction in which said stage and said

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plurality of support members relatively are moved; and
unloading said object from said stage by relatively
moving said plurality of support members and said stage.

5 12. The method according to claim 1, further
comprising:

transferring said object to a position before said
supporting, said one surface of said object can be
supported at the position by said plurality of support
10 members.

13. The method according to claim 1, further
comprising:

positioning said object to said stage in a
15 two-dimensional plane parallel to a surface of said
object by relatively moving said plurality of support
members and said stage along the two-dimensional plane
before loading said object onto said stage.

20 14. The method according to claim 1, wherein
openings are formed in said object, said plurality of
support members can pass through said openings.

15 15. The method according to claim 14, wherein said
object includes a mask and a frame member, a
predetermined circuit pattern being formed on said mask,
said frame member being securely fixed on said mask, and

said openings being formed in said frame member.

16. An exposure method comprising:

supporting one surface of a first object by a
5 plurality of support members;

loading said first object supported by said
plurality of support members onto a stage;

withdrawing said plurality of support members from
said first object to an other surface side of said object
10 after said first object is loaded onto said stage; and

transcribing a pattern of said first object onto a
second object through an optical system while detecting
positions of said first object supported on said stage
and said second object in an optical axis direction of
15 said optical system.

17. The method according to claim 16, wherein the
pattern of said first object is transcribed while said
stage holding said first object and said second object
20 are synchronously moved in predetermined directions
within planes perpendicular to said optical axis of said
optical system.

18. A transfer apparatus for transporting an object
25 to be transferred to/from a stage, comprising:

a plurality of support members which supports one
surface of said object; and

a first driving mechanism which drives said plurality of support members in a first direction between a first position on one surface side of said object and a second position on an other surface side opposite to said one surface side.

19. The apparatus according to claim 18, further comprising:

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10 a second driving mechanism which drives said plurality of support members in respective directions within a plane perpendicular to said first direction.

20. The apparatus according to claim 19, wherein openings are formed in said object, said plurality of support members being able to be inserted/withdrawn through said openings in said first direction.

21. The apparatus according to claim 20, wherein said plurality of support members are able to move by a predetermined amount within said openings while said support members are inserted.

22. The apparatus according to claim 21, wherein said plurality of support members are able to rotate by a predetermined amount within said openings while said support members are inserted.

23. The apparatus according to claim 22, wherein
said openings are arcuated through-holes.

24. The apparatus according to claim 22, wherein
5 said openings are notches formed in an outer
circumferential portion of said object.

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25. The apparatus according to claim 20, wherein
said object includes a mask and a frame member, a
10 predetermined circuit pattern being formed on said mask,
said frame member being securely fixed on said mask, and
said openings are formed in said frame member.

26. The apparatus according to claim 25, wherein
15 said mask is a circular mask, and said frame member is a
support ring, said mask is mounted on said support ring.

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27. The apparatus according to claim 18, further
comprising:
20 an elastic member arranged on a contact portion of
said support member, said contact portion coming into
contact with said object.

28. The apparatus according to claim 18, further
25 comprising:
a cylindrical cover arranged around a driving shaft
of said first driving mechanism.

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29. An exposure apparatus for transcribing a pattern formed on a first object onto a second object through an optical system, comprising:

- 5 a stage which mounts said first object; and
- a transfer system which transports said first object to/from said stage, said transfer system including
- a plurality of support members which supports one surface of said first object; and
- 10 a first driving mechanism which drives said plurality of support members in a first direction between a first position on said one surface side of said object and a second position on said other surface side opposite to said one surface.

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30. The apparatus according to claim 29, wherein said stage moves between a transportation position and an exposure position, said first object being transported to/from said transfer system at said transportation
- 20 position, and the pattern being transcribed onto said second object at said exposure position.

31. The apparatus according to claim 30, further comprising:

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- 25 an interferometer system which manages the transport and exposure positions and a position of said stage during movement between the transport and exposure

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positions.

32. The apparatus according to claim 31, wherein said interferometer system comprises:

5 a first interferometer subsystem which manages the position of said stage, located at the transportation position, in a two-dimensional plane perpendicular to the first direction; and

a second interferometer subsystem which manages the
10 position of said stage, located at the exposure position, in the two-dimensional plane, and wherein

interferometer beams from said first and second
interferometer subsystems simultaneously irradiate a
single reflecting surface of said stage while said stage
15 is moving between the transportation position and the exposure position.

33. The apparatus according to claim 29, further comprising:

20 a measurement device, said measuring device including

a mark detection system arranged on a side of said optical system at the transportation position, and wherein

25 said measurement device system detects a positioning mark formed on said first object before said first object is loaded onto said stage.

34. The apparatus according to claim 29, wherein said optical system is an electron optical system.

5 35. The apparatus according to claim 29, wherein a mounting surface to mount said first object is formed on a bottom surface of a recess portion formed in said stage.

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10 36. A method of manufacturing an exposure apparatus for transcribing a pattern formed on a first object onto a second object through an optical system, comprising:

providing a first stage which mounts said first object;

providing a transfer apparatus which transports said
15 first object to/from said first stage, said transfer apparatus including:

a plurality of support members which supports one surface of said first object; and

a first driving mechanism which drives said
20 plurality of support members in a first direction between a first position on one surface side of said object and a second position on said other surface side opposite to said one surface;

providing said optical system; and

25 providing a second stage which mounts said second object.

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37. The method according to claim 36, further comprising:

providing an interferometer system which manages a transport position, an exposure position, and a position
5 of said first stage during movement between the transport and exposure positions, said first object being transported to/from said transfer apparatus at said transportation position, said pattern being transcribed onto said second object at said exposure position, and
10 said first stage moving between said transportation position and said exposure position.

38. A device manufacturing method comprising:
performing a lithographic process by using said exposure
15 apparatus defined in claim 29.

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